



ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 970-84
 UNIQUE ID NUMBER: 01P18RR103
 COMBUSTOR: Phase5 Tiled
 ENGINE TYPE: TF

BYPASS RATIO: 8.5
 PRESSURE RATIO (π_{00}): 38.0
 RATED THRUST (F_{00}) (kN): 338.7

REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO _x	SMOKE NUMBER
D _p /F ₀₀ (g/kN) or SN	0.2	18.0	52.6	8.3
AS % OF ORIGINAL LIMIT	1.1	15.3	45.4	49.1
AS % OF CAEP/2 LIMIT (NO _x)			56.7	
AS % OF CAEP/4 LIMIT (NO _x)			63.4	
AS % OF CAEP/6 LIMIT (NO _x)			70.2	
AS % OF CAEP/8 LIMIT (NO _x)			79.6	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

DATA STATUS

- PRE-REGULATION
 x CERTIFICATION
 - REVISED (SEE REMARKS)

TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES
 x DEDICATED ENGINES TO PRODUCTION STANDARD
 - OTHER (SEE REMARKS)

EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE
 (ANNEX 16 VOLUME II)

CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)
 - OUT OF PRODUCTION (DATE: -)
 - OUT OF SERVICE (DATE: -)

MEASURED DATA

MODE	POWER SETTING (%F ₀₀)	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO _x	
TAKE-OFF	100	0.7	2.605	0.02	0.32	38.29	6.1
CLIMB OUT	85	2.2	2.157	0.12	0.31	29.42	6.4
APPROACH	30	4.0	0.720	0.08	1.16	12.09	3.0
IDLE	7	26.0	0.255	0.04	13.38	5.44	0.6
LTO TOTAL FUEL (kg) or EMISSIONS (g)			965	65	5650	16826	-
NUMBER OF ENGINES				3	3	3	3
NUMBER OF TESTS				6	6	6	6
AVERAGE D _p /F ₀₀ (g/kN) or AVERAGE SN (MAX)				0.2	16.7	49.7	7.1
SIGMA (D _p /F ₀₀ in g/kN, or SN)				0.1	1.8	1.9	2.7
RANGE (D _p /F ₀₀ in g/kN, or SN)				0.13-0.26	15.2-18.62	47.9-51.66	5.2-9

ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT - POWER SETTINGS
 STAGE BLEED 0 (% CORE FLOW) AT - POWER SETTINGS

ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	99.7-101.9
TEMPERATURE (K)	276.6-286.7
ABS HUMIDITY (kg/kg)	0.00243-0.01133

FUEL

SPEC	
H/C	1.88
AROM (%)	18.2

MANUFACTURER: Rolls-Royce plc
 TEST ORGANIZATION: Rolls-Royce
 TEST LOCATION: Derby
 TEST DATES: 17/10/2003-26/04/2016

NO_x REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

REMARKS

- Data from Certification Report EDNS01000588914 Iss 1
- Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
- NO_x levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

Compliance with Fuel Venting requirements: x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)